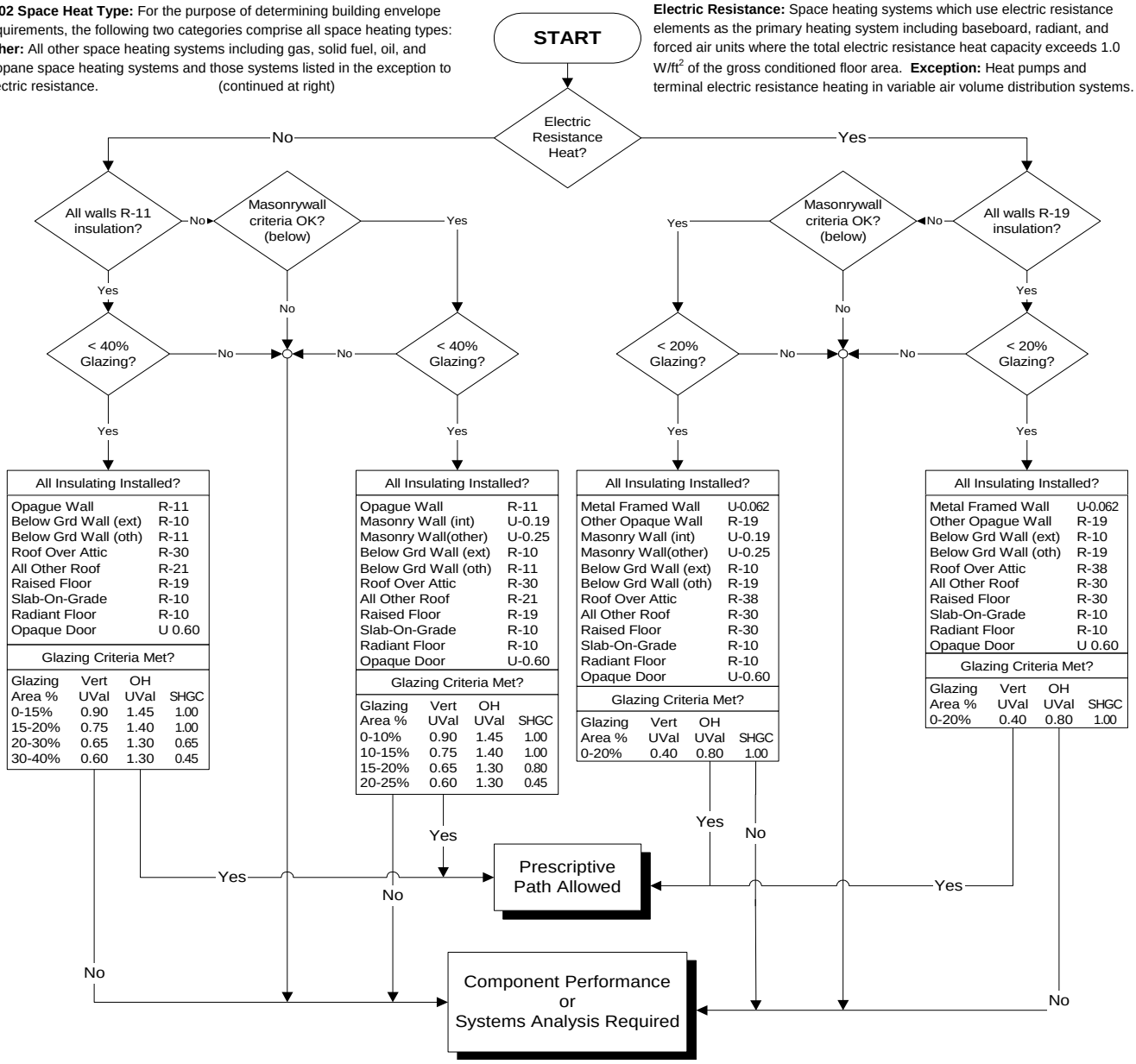
Envelope Summary (back) Climate Zone 1 ENV-SUM

Decision Flowchart for Prescriptive Option

Use this flowchart to determine if project qualifies for the optional Prescriptive Option. If not, either the Component Performance or Systems Analysis Options must be used.

1302 Space Heat Type: For the purpose of determining building envelope requirements, the following two categories comprise all space heating types: **Other:** All other space heating systems including gas, solid fuel, oil, and propane space heating systems and those systems listed in the exception to electric resistance. (continued at right)

Electric Resistance: Space heating systems which use electric resistance elements as the primary heating system including baseboard, radiant, and forced air units where the total electric resistance heat capacity exceeds 1.0 W/ft^2 of the gross conditioned floor area. **Exception:** Heat pumps and terminal electric resistance heating in variable air volume distribution systems.



Concrete/Masonry Option*

Assembly Description	Assy.Tag	HC**	Area (sf)	HC x Area
		Totals		
		Area weighted HC: divide total of (HC x area) by Total Area		

Wall Heat Capacity (HC)

*If the area weighted heat capacity (HC) of the total above grade wall is a minimum of 9.0, the Concrete Masonry Option may be used. **For framed walls, assume HC=1.0 unless calculations are provided; for all other walls, use Section 1009.

2001 Washington State Nonresidential Energy Code Compliance Form

Envelope UA Calculations Climate Zone1 ENV-UA

2001 Washington State Nonresidential Energy Code Compliance Forms — Revised June 2002 KJM

Project Address		Date
Space Heat Type	◯ Electric resistance ◯ All other	For Building Department Use
Glazing Area as % gross exterior wall area	Prop. / Max.Target	
Concrete/Masonry Option	◯ Yes ◯ No	

Notes: If glazing area exceeds maximum allowed in Table, then calculate adjusted areas on back (over). If Concrete/Masonry Option is used, Target U-factors, SHGC and Glazing % will be different than shown below. Refer to Table 13-1 for correct values.

	Building Component List components by assembly ID & page #	Proposed UA U-factor x Area (A) = UA (U x A)	Target UA U-factor x Area (A) = UA (U x A)
Vertical Glazing	U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID:		Glazing % / Electric Resist. / Other Heating 0-15% 0.40 0.90 >15-20% 0.40 0.75 >20-30% see note above 0.60 >30-40% see note above 0.50 (see Table 13-1 for Conc/Masonry values)
Overhead Glazing: Over Attics	U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID:		Glazing % / Electric Resist. / Other Heating 0-15% 0.80 1.45 >15-20% 0.80 1.40 >20-30% see note above 1.30 >30-40% see note above 1.25 (see Table 13-1 for Conc/Masonry values)
Overhead Glazing: Oth.Roofs	U= Plan ID: U= Plan ID: U= Plan ID: U= Plan ID:		
Opaque Doors	U= Plan ID: U= Plan ID: U= Plan ID:		Electric Resist. / Other Heating 0.60 0.60
Roofs Over Attics	R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating 0.031 0.036
Other Roofs	R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating 0.034 0.050
Opaque Walls*	R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID: **Note: sum of Target Areas here should equal Target Opaque Wall Area (see back)		** ** ** Electric Resist. / Other Heating Ordinary 0.062 0.14 Conc(int) 0.19 0.19 Conc(oth) 0.25 0.25
Below Grade Walls	R= Plan ID: R= Plan ID: R= Plan ID: Note: if insulated to levels required for opaque walls, list above with opaque walls		Electric Resist. / Other Heating 0.062 0.14
Floors Over Uncond. Sp	R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating 0.029 0.056
Slab-on-grade Radiant	R= Plan ID: R= Plan ID: R= Plan ID: R= Plan ID:		Electric Resist. / Other Heating F=0.54 F=0.54 (see Table 13-1 for radiant floor values)
	Totals		**Totals**

*For CMU walls, indicate core insulation material.

For compliance:

1) Proposed Total Area shall equal Target Total Area, and 2) Proposed Total UA shall not exceed Target Total UA.

Climate Zone 1 ENV-SHGC

	Glazing List components by assembly ID & page #	Proposed SHGC SHGC*	x Area (A)	= SHGC x A	Target SHGC SHGC	x Area (A)	= SHGC x A
Glazing	ID:						
	ID:				Glazing %	Electric Resist.	Other Heating
	ID:				0-20%	1.00	1.00
	ID:				>20-30%	not allowed	0.65
	ID:				>30-40%	not allowed	0.45
	ID:				(see Table 13-1 for Conc/Masonry values)		
	Totals				**Totals**		

*Note: Manufacturer's SC may be used in lieu of SHGC.

For compliance: Proposed total SHGC x A shall not exceed Target total SHGC x A

NOTE: Since 1997 SHGC compliance for vertical and overhead glazing is allowed to be calculated together.

Target Area Adjustment Calculations

If the total amount of glazing area as a % of gross exterior wall area (calculated on ENV-SUM1) exceeds the maximum allowed in Table 13-1, then this calculation must be submitted Use the resulting areas in the Target UA and SHGC calculations above.

Proposed Areas: Numbered values are used in calculations below.

	Roofs over Attics	Other Roofs	Walls
Glazing Area	OG=	OG=	VG=
Opaque Area			

Note:
OG = overhead glazing
VG = vertical glazing

Gross Exterior Wall Area [ ] x Max Glazing Area (Table 13-1) [ ] ÷ [100] = Maximum Target Glazing Area [ ]

[ ] – Target OG Area in Roofs over Attics [ ] ⇳ lesser = Max OG Remaining [ ] – Target OG Area in Other Roofs [ ] ⇳ lesser = Target VG Area [ ]

For Target OG's, the lesser values are used both here and below.

	Proposed Opaque Area	+	Proposed OG Area	–	Target OG Area	=	Target Opaque Area
Roofs over Attics		+		–		=	
Other Roofs		+		–		=	

	Proposed Opaque Area	+	Proposed VG Area	–	Target VG Area	=	Target Opaque Area	
Walls		+		–		=		Target Areas OK

Note: If there is more than one type of wall, the Target VG Area may be distributed among them, and separate Target Opaque Areas found.
If the Target Areas for Opaque Walls listed on the front must equal the total calculated here.

Target values in shaded boxes are used in the applicable Target UA calculations on the front.
Target VG Area and Total Target OG Area are also used in the applicable Target SHGC calculations above.

Envelope Summary — Climate Zone 1 — ENV-SUM

Project Info	Project Address	Date
		For Building Department Use
	Applicant Name:	
	Applicant Address:	
	Applicant Phone:	

Project Description ☐ New Building ☐ Addition ☐ Alteration ☐ Change of Use

Compliance Option ☐ Prescriptive ☐ Component Performance (See Decision Flowchart (over) for qualifications) ☐ ENVSTD 2.1 (4.0 not acceptable) ☐ Systems Analysis

Space Heat Type ◯ Electric resistance ◯ All other (see over for definitions)

Glazing Area Calculation

Note: Below grade walls may be included in the Gross Exterior Wall Area if they are insulated to the level required for opaque walls.

Electronic version: these values are automatically taken from ENV-UA-1.

Total Glazing Area (rough opening) (vertical & overhd)	divided by	Gross Exterior Wall Area	times 100 equals	**% Glazing**
	÷		X 100 =	

Concrete/Masonry Option ◯ yes ◯ no — Check here if using this option and if project meets all requirements for the Concrete/Masonry Option. See Decision Flowchart (over) for qualifications. Enter requirements for each qualifying assembly below.

Envelope Requirements (enter values as applicable)	
Fully heated/cooled space	
	Minimum Insulation R-values
Roofs Over Attic	
All Other Roofs	
Opaque Walls[1]	
Below Grade Walls	
Floors Over Unconditioned Space	
Slabs-on-Grade	
Radiant Floors	
	Maximum U-factors
Opaque Doors	
Vertical Glazing	
Overhead Glazing	
	Maximum SHGC (or SC)
Vertical/Overhead Glazing	

Semi-heated space [2]	
	Minimum Insulation R-values
Roofs Over Semi-Heated Spaces[2]	

1. Assemblies with metal framing must comply with overall U-factors
2. Refer to Section 1310 for qualifications and requirements

Opaque Concrete/Masonry Wall Requirements

Insulation on interior - maximum U-factor is 0.19

Insulation on exterior or integral - maximum U-factor is 0.25

If project qualifies for Concrete/Masonry Option, list walls with HC ≥ 9.0 Btu/ft²•°F below (other walls must meet Opaque Wall requirements). Use descriptions and values from Table 20-5b in the Code.

Wall Description (including insulation R-value & position)	**U-factor**

Notes: